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ABSTRACT

The second and third years of full-scale operation (July 1966-June 1968) of the Institute of Library Research are reported. Specific projects undertaken are grouped into six broad categories: (1) values in library and information service, (2) library and information systems, (3) methodology research, (4) information services development, (5) social and professional impact on automated information services and (6) operations. (For the annual report for the fourth year of full-scale operation of the Institute see LI 003313) (Author/NH)

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INSTITUTE OF LIBRARY RESEARCH

BI-ANNUAL REPORT

July 1966-June 1968

R. M. Hayes
M. E. Maron

LI 003 314

30 June 1968

Institute of Library Research
University of California
Los Angeles and Berkeley

ABSTRACT

The "Bi-Annual Report, July 1966-June 1968" is the second progress report of the Institute of Library Research. It covers the activities of the Institute during a period of extremely rapid growth, particularly of the branch at Berkeley.

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1. INTRODUCTION

This is the report on the second and third years of full-scale operation of the Institute of Library Research. It was established in September 1963 as a result of the recognition by the University of the need for organized research into the problems faced by the library today. Much of the initial impetus for establishment of the Institute arose from a recognition of the magnitude of the pragmatic, operational problems faced by the Libraries of the University of California--nine campuses, numerous branch libraries, proliferating special information centers, needs for equal access by all campuses to the total resources of the University. It was evident that solution of these problems required fundamental research and not simply fragmented implementation of makeshift answers to isolated local problems. It was also evident that the problems faced by the University of California were the epidemic ones in the nation's information systems. Furthermore, it seemed likely that, because of its size and diversity, the University of California represented an ideal experimental vehicle for study of solutions to national problems as well as its own.

The intent of the research program of the Institute of Library Research can be summarized in a single statement: To understand and to solve the problems in better library service to needs for information. Within this very broad statement, however, there are specifics which represent, on the one hand, our knowledge of those problems which are most evident today and, on the other hand, our knowledge of the methods and techniques which seem to be applicable. The research program, and even the Institute of Library Research itself, represent the crystallization of a wide variety of concepts about these problems and techniques which have been gradually taking shape over the last several years: the evolution of new methods of recording and

disseminating knowledge; the mechanization of processes in the library, both clerical and intellectual; the utilization of capabilities of equipment, both appropriately and economically; the increasing volume and variety of literature and the needs for better information services; the growing complexity of research itself; the changing nature of research objectives and methods; the continuing examination by the research library of its own role and functions; the extension in scope of research library services and methods; the integration of individual research libraries into larger systems; the proliferation of research projects in information handling and communication; the development of methodologies for solution of specific information problems; the education of appropriate research and professional personnel. These represent the immediate concern of the research program of the Institute of Library Research and the purposes of its research program.

THE INSTITUTE'S PROGRAM

The Institute's research program has been based on the philosophy that the problems in better information services are all parts of a whole; any solution of them must start from recognition of that whole. The research plan therefore has resulted in the initiation of research projects in such a way as to produce an interrelating, mutually supporting set of studies.

Specific projects have been undertaken within six broad areas: (1) values in library and information service, (2) library and information systems, (3) methodology research, (4) information services development, (5) social and professional impact on automated information services, and (6) operations.

1. Values in library and information service

This program has been concerned with the social and scholarly environment of the library and other information activities. What goals are to be served? How can the quality of library collections be assessed? How are

books and information used? What are the criteria for the design of library systems? What is the value of library services in education, research, and management, and how can it be measured? What is the relationship between the value of services and the response time of them? What are the problems in gaining acceptance of new services, both by the library and its users, and how can they be solved?

Specific studies in this area have included: (1) studies of criteria for the growth of library collections, (2) studies of research faculty needs for mechanized information services, (3) studies of the patterns of use of public libraries.

2. Library and information systems

This program has been concerned with the nature of library and information systems, the definition of their components and of the interrelationships of those components at various levels--local, universitywide, regional, and national. Characteristic projects in this area have included the analysis of present library organizations (e.g., the UC system), experimentation with new or alternative forms and types of services (e.g., facsimile transmission), and the development and evaluation of new systems (e.g., the mechanization of library processes suitable for universitywide application and the utilization of bibliographical data produced by national agencies in machine-readable form).

3. Methodology research

This program has been concerned with the development of basic methods by which libraries and information systems can be designed and evaluated. Characteristic projects have studied the tools for development of vocabulary (e.g., glossary, thesaurus, subject authority), for file indexing and organization, for cost accounting in information activities, for the measurement of file effectiveness, for definition of user needs, for evaluation of equipment, and so on.

The starting point for all of the research in this area is measurement--of value, of effectiveness, of efficiency, of performance--for each of the aspects of an information system. The intent is both to develop an adequate theory for information system design and to provide useful tools to aid in design.

The value of this research to the other program areas is evident--it provides the analytical basis on which other studies can be performed with increased rigor and applicability. More directly, however, the value of this research can be seen in the extent to which it is being used in the system studies of area 2 and in the Center development of area 4, since the methods sought are precisely those so essential to system analysis and design. On the other hand, the studies in the other areas have equal significance to analytical methodology development--they provide the means to test the utility of the methods and the validity of the theoretical analysis.

4. Center for Information Services

This program has been concerned with the development of a general purpose capability for providing computer-based information services within the library, which can be utilized by any university activity desiring to establish an information center, together with research into the problems involved in such a capability. A Center for Information Services will mobilize the intellectual facilities (knowledge of computer programs for language data processing, of man-machine communication problems, of analysis and simulation based on data files) of the campus for experimentation with advanced services that are not now, but may in the future be, encompassed by the university libraries.

5. Social and professional impact

This program has been concerned with the professional and social implications of the use of the computer for accumulating, storing, and

retrieving information. Modern data processing raises immense social, moral, and legal problems, such as pressures toward conformity, the invasion of privacy, the degradation of art and craft to machine work, the violation of copyright, and the control of huge, consolidated data files on people and institutions. Also, the responsibilities of librarianship will need to be greatly broadened, in terms of both the functions within it and the fields to which it is applicable, as the computer demonstrates the need of library knowledge in fields of science, technology, government, and business that are outside the traditional scope of library operations.

Of particular importance in this area are the implications for education in librarianship and information science--its form, its content, and the types of students.

A major purpose of the Institute of Library Research has been actively to support and extend the programs of the library schools through joint faculty appointments and the employment of students as research assistants. It has experimented with the development of new curricula. It has sponsored conferences, symposia, seminars, and special courses in cooperation with University Extension. In addition, funds have been separately sought to offer advanced post-graduate training programs for practicing librarians and fellowships to bring experienced persons, including staff of the UC libraries, to the Institute for work on specific research projects.

6. Operations

A Task Force Project has been organized to attack the pressing, operational problems of the UC libraries about which early administrative decisions must be reached. University funds are provided for this program. The Task Force Project has worked directly, as consultants, with the systems staff members of the several libraries on specific problems for which compatible, universitywide solutions are sought. These short-term efforts,

of course, have frequently related to the areas of research outlined above and have been coordinated with longer-term projects. Their particular purpose, however, has been the marshalling of existing knowledge, technique, and judgment for early action.

We have already commented on the contribution which studies in the area of operations will make in the areas of systems studies and the Center for Information Services. There is an equally important contribution in the opposite direction. In fact, part of the underlying philosophy of the proposed research program is the transformation of research results into operations.

To see this picture of a large, complex research program in proper perspective, it is important to recognize the role of research in modern librarianship. Libraries are not hypothetical organizations and information handling is not an experiment for them; it's an operational reality. Research therefore has meaning to libraries only to the extent that it has a fundamental effect on the way in which they actually carry on their operational tasks. In view of this, there is a strong thread of pragmatism in the research program of the Institute of Library Research. It is evident in the Task Force, in the placement of the Center for Information Services in the library rather than isolated from it, in the approach to development of larger library systems.

As a result, the role of the Institute of Library Research can best be visualized as that of a catalyst - aiding the transfer of research results into improved practice and accelerating the rate at which that transfer occurs. If the Institute adequately fills that role, it will be because the libraries of the country are themselves willing to utilize the results of modern research in librarianship.

REVIEW OF HISTORY

To put the program of the Institute into historical context, the following is a brief chronology of the Institute from January 1963 to June 1968:

1963 January: Proposal for Institute of Library Research submitted to President Kerr by Robert Vosper, Secretary of the Library Council.

September: The Institute was founded.

November: A search committee (for director) and the Faculty Advisory Committee (for the Institute) appointed by President Kerr.

1964 January-June: A panel of consultants made recommendations concerning the research program of the Institute (referenced below).

September: Dean Raynard C. Swank appointed as Acting Director and Professor Robert M. Hayes as Associate Director of the Institute.

November: Program Plan, including an "Operations Task Force" approved by Library Council and Faculty Advisory Committee.

1965 February: "Operations Task Force" established and funded, and Ralph Shoffner appointed as Project Manager.

February-June: Proposals were developed for various projects--research, development, and public service--sub submitted to funding agencies, and initiated.

October: Professor Robert M. Hayes appointed as Director of the Institute and Dean Raynard C. Swank as Associate Director.

1966 January-June:	A second set of proposals were developed, submitted to funding agencies and projects were initiated.
July:	Professor M. E. Maron appointed Associate Director of the Institute and manager of the Berkeley branch.
July-December:	A third set of proposals were developed and submitted to funding agencies, and projects were initiated.
1967 January-December:	Primary emphasis on the performance of the work to which the Institute was committed, especially on the completion of the first major set of projects.
1968 January-June:	A fourth set of proposals were developed, most of them for continuation of the work of prior projects.

References

Taube, Mortimer, A Program for the Library Research Institute of the University of California, Documentation, Incorporated (n.d., c. February 1964).

Hayes, Robert M., The Library Research Institute of the University of California, 8 April 1964.

Fussler, Herman H., Recommendations on the Program of the University of California Library Research Institute, 16 August 1964.

ADMINISTRATION

Administratively, the Institute now consists of two main branches, one at Los Angeles and one at Berkeley, and the Task Force Project, centered at Berkeley. Figure 1 is an organization chart showing this structure. Within it, the administration is organized basically along project lines, with heavy use of student research assistants. Figure 2 is a staff list by project, as of 30 June 1968.

Figure 1

University of California

Institute of Library Research

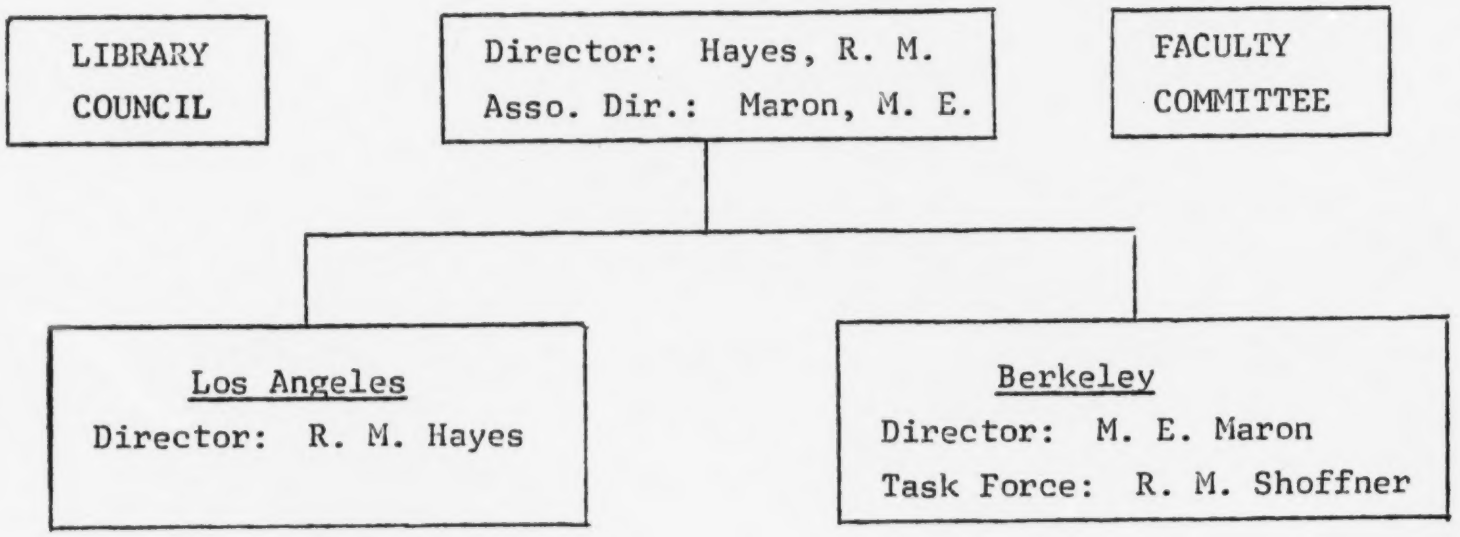

Figure 2

FILE ORGANIZATION (National Science Foundation)

Name	Position
Stewart Beal	Research Assistant
Kevin Reilly	Assistant Researcher
Steven Silver	Programmer
Edward Bertram	Statistician
T. S. Motzkin	Professor (Math)
H. Garrett	Research Assistant

HANDBOOK OF DATA PROCESSING (Council on Library Resources)

Name	Position
J. Becker	Consultant
F. Bellomy	Librarian
J. Troutman	Librarian
R. Sniffen	Research Assistant
S. Weiss	Research Assistant
R. Rosario	Research Assistant

EXTENSION COURSES (State Technical Services)

Name	Position
J. Fitz	Program Coordinator

CATALOGING PRINCIPLES (Office of Education)

Name	Position
S. Lubetzky	Professor (SLS)
N. Brault	Librarian

LIBRARY USE (Los Angeles Public Library)

Name	Position
J. Cushman	Senior Lecturer
C. Bedoian	Research Assistant
L. Profant	Research Assistant

FILE ORGANIZATION (Office of Education)

Name	Position
Arjun Aiyer	Research Assistant
Marcia Bates	Jr. Specialist
Kelley Cartwright	Assistant Specialist
Ruth Dunham	Research Assistant
Ann Frye	Research Assistant
Luke Howe	Jr. Specialist
Mary Poole	Research Assistant
Lucy Liang	Research Assistant
John Reinke	Programmer
Will Schieber	Assistant Specialist
Steve Silver	Programmer

CALIFORNIA STATE LIBRARY PROCESSING CENTER

Name	Position
Jay Cunningham	Associate Specialist
Tom Hargrove	Jr. Specialist
Ugertha Hodges	Senior Coder
Robert Randolph	Research Assistant
Jorge Rodriguez	Research Assistant
Roy Torkington	Jr. Specialist

TASK FORCE

Name	Position
Diane Kristell	Research Assistant (Also on C.S.L., Context, Comp. Lab., & F.O.)
Ralph Shoffner	Specialist and Head, Operations Task Force
Harriet Zais	Junior Specialist

CONTEXT (National Science Foundation)

Name	Position
Deborah Barrett	Junior Specialist
Laura Gould	Programmer
Ruth Patrick	Junior Specialist (also on Comp. Lab.)
Pepe Siy	Research Assistant
Stephen Smith	Associate Specialist
Keith Stirling	Research Assistant
Nancy Voigt	Junior Specialist

COMPUTER LAB

Name	Position
Jean Circiello	Research Assistant
Marco Fiorello	Research Assistant
Allan Humphrey	Specialist
Lauro Lazo	Research Assistant
Joseph Meredith	Assistant Specialist
Chakravarthi Ravi	Programmer
Betty Robinson	Research Assistant
Helen Yen	Junior Specialist

The following reports have been produced as part of the administrative work of the Institute:

1966

Hayes, R. M., Report to the Library Council, Project Status: Goals for the Libraries of the University of California for the Period 1966 to 1980, ILR, January 31, 1966.

Hayes, R. M., Statistics on the Librarians of the State of California, ILR, UCLA, 30 November 1966.

Hayes, R. M., "The Research Program of the Institute of Library Research," Library Journal 91 4579-4585, October 1, 1966.

Hayes, R. M., Annual Report, July 1965-June 1966, Institute of Library Research.

1967

Hayes, R. M., Criteria for Library Growth 1967-1980: Progress Report, Internal Working Report, ILR, UCLA, 1967.

Hayes, R. M., Program Plan for Development of a Computer-Based Laboratory for Teaching of Data Processing in Libraries, ILR, UCLA, 1 October 1967.

Hayes, R. M., "Library Handling of Books and their Contents," in Computers and Education, edited by Ralph W. Gerard, McGraw-Hill, 1967, 111-150.

Hayes, R. M. and Tompkins, Mary L., Program Plan for Development of an Operational On-Line Citation Index in Mathematics, ILR, UCLA, 1 October 1967.

Hayes, R. M. and Reilly, K. D., Program Plan for Application of Simulation to the Usage of Library Networks, ILR, UCLA, 1 October 1967.

Hayes, R. M., Program Plan for a "Delphi Study" to Develop a Scheduled Plan for Automation in Libraries, ILR, UCLA, 1 October 1967.

SUMMARY OF PROJECTS

In subsequent sections of this report, details are presented about each of the projects which the Institute has undertaken, within the context of research, development, education, or public service. The progression of work in the Institute can best be seen in the following chart, Figure 3. Several significant aspects of the Institute's program can be seen from this chart:

(1) The work has been fairly evenly divided between the two campuses, although the timing has been quite different. The work on the Los Angeles campus began about two years before that at Berkeley, reflecting the earlier appointment of key staff at Los Angeles.

(2) Most of the projects on the Los Angeles campus have required extensions in time ranging from six months. This resulted from problems in adequately staffing to meet the workload.

(3) Projects have generally been initiated within three to six months after formal proposals were submitted.

(4) Most of the projects have led to subsequent projects for continuation of the prior work.

Figure 4 presents a summary of the sources of support. (Parenthetically, it is of some interest to note that the ratio of extramural to intramural support is about three to one. This is roughly comparable to the experience of other organized research units of the general size of the Institute of Library Research.)

Figure 3

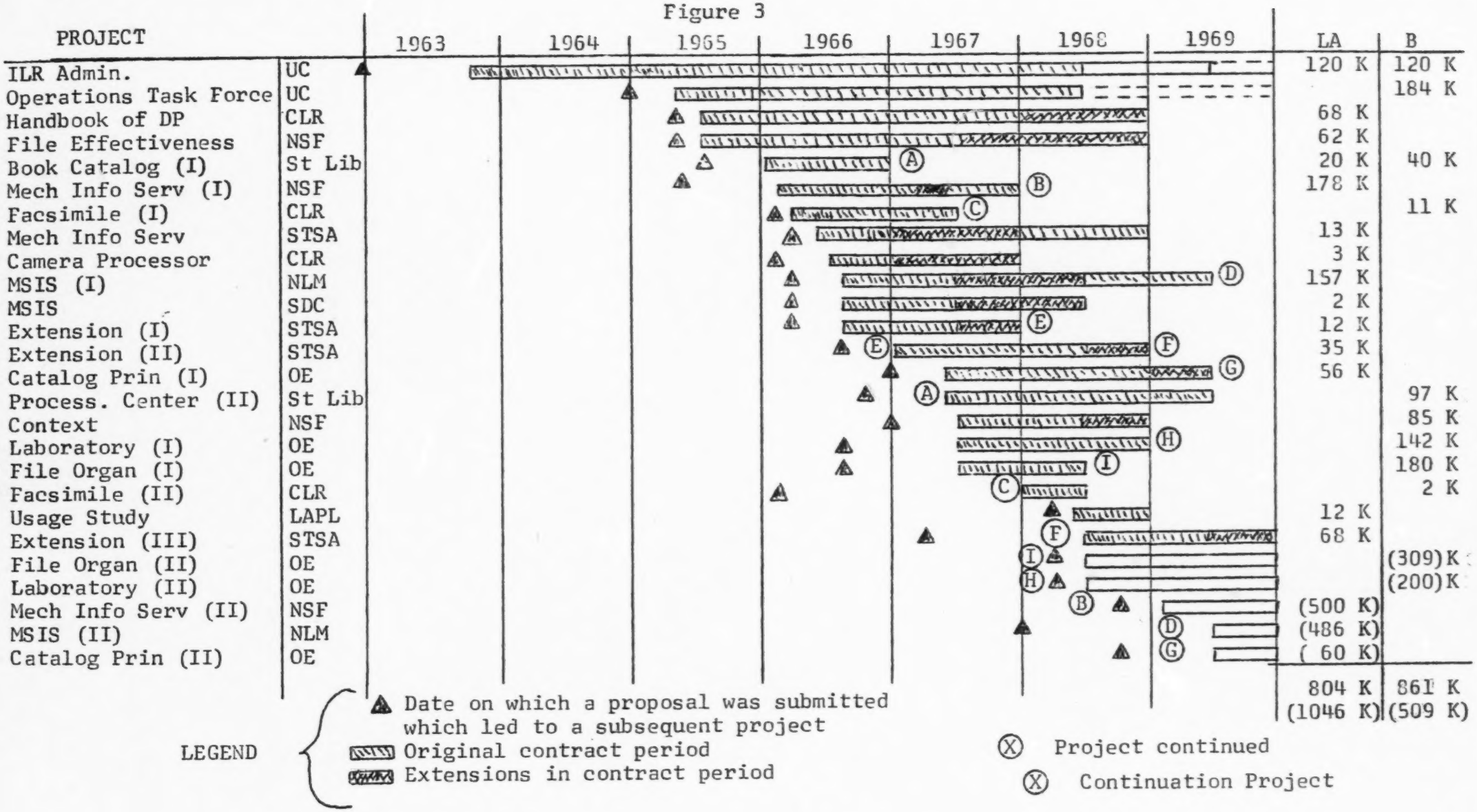
PROJECT
1963
1964
1965
1966
1967
1968
1969
LA
B
ILR Admin. UC 120 K 120 K
Operations Task Force UC 184 K
Handbook of DP CLR 68 K
File Effectiveness NSF 62 K
Book Catalog (I) St Lib 20 K 40 K
Mech Info Serv (I) NSF 178 K
Facsimile (I) CLR 11 K
Mech Info Serv STSA 13 K
Camera Processor CLR 3 K
MSIS (I) NLM 157 K
MSIS SDC 2 K
Extension (I) STSA 12 K
Extension (II) STSA 35 K
Catalog Prin (I) OE 56 K
Process. Center (II) St Lib 97 K
Context NSF 85 K
Laboratory (I) OE 142 K
File Organ (I) OE 180 K
Facsimile (II) CLR 2 K
Usage Study LAPL 12 K
Extension (III) STSA 68 K
File Organ (II) OE (309) K
Laboratory (II) OE (200) K
Mech Info Serv (II) NSF (500 K)
MSIS (II) NLM (486 K)
Catalog Prin (II) OE (60 K)
804 K 861 K
(1046 K) (509 K)
A
B
C
D
E
F
G
H
I
LEGEND
Date on which a proposal was submitted which led to a subsequent project
Original contract period
Extensions in contract period
Project continued
Continuation Project

Figure 4

	UC	CLR	NSF	St Lib	STS	NLM	OE	SDC	LAPL
ILR Admin.	240K								
Task Force	184K								
Handbook		68K							
File Effectiveness			62K						
Book Catalog (I)				60K					
Mech Info Serv (I)			178K						
Mech Info Serv					13K				
Camera Processor		3K							
Facsimile (I)		11K							
MSIS (I)						157K			
MSIS								2K	
Extension (I)					12K				
Extension (II)					35K				
Catalog Prin (I)				97K			56K		
Proc. Center (II)				97K					
Context			85K						
Laboratory (I)							142K		
File Organ (I)							180K		
Facsimile (II)		2K							
Usage Study									12K
Extension (III)					68K				
	424K	84K	325K	157K	128K	157K	378K	2K	12K

2. RESEARCH PROJECTS

The research projects of the Institute have been directed at a number of basic problems in information retrieval, file organization, and library systems.

MEASUREMENT OF FILE OPERATING EFFECTIVENESS

Administrative.

Principal Investigator: Professor R. M. Hayes, UCLA

Co-Principal Investigator: Professor T. S. Motzkin, UCLA

Sponsoring Agency: National Science Foundation

Period: 7/1/1965 to 6/30/1967 (extended to 12/31/1968)

Amount: $62,000

Purpose.

The purpose of this research project has been to develop a set of analytical tools by which to measure the performance of file systems. The problems considered are as follows:

(1) The criterion for measurement of performance of a file system

(2) The measurement of "information"

(3) The effects of error (or uncertainty) in the data

(4) The effects of *a priori* structure in the vocabulary for description of data

(5) The effects of various methods for file organization and search.

In the study, cost-effectiveness (in the form CT/N, where C is the cost of the file system, T is the response time from it, and N is the "amount of information" provided) is taken as the primary criterion for measurement of performance. "Information" is measured by a generalization of the traditional Shannon measure in order to take proper account of more complex processes for generating "information" than simple data transfer.

The effects of error are handled by varying the amount of output provided. The effects of a priori structure are handled by decomposition of the vocabulary. The effects of file organization and search are being studied by simulation.

Reports.

Hayes, R. M., "Forms of Input (Signals Through Non-numeric Information)" in Electronic Information Handling. Edited by Allen Kent, Spartan, 1965.

Hayes, R. M., "The Measurement of Information from a File." In Statistical Association Methods for Mechanized Documentation; Symposium Proceedings, Washington, 1964. Edited by M. E. Stevens, V. E. Giuliano, L. B. Heilprin, U.S. Department of Commerce, National Bureau of Standards, Washington, D.C., 15 December 1965, pp. 161-162.

Hayes, R. M., "A Theory for File Organization," in On-Line Computing: Time-Shared Man-Computer Systems, edited by Walter J. Karplus, McGraw-Hill Book Company, 1967, 264-289.

Hayes, R. M., "The Decomposition of Vocabulary Hierarchies," a Report Presented in Summary at the Joint IFIP-Fid Meeting, Rome, Italy, 14-17 June 1967. (To be published in the Proceedings of that meeting.)

Hayes, R. M. and Reilly, K. D., "The Effect of Response Time Upon Utilization of an Information Retrieval System: A Simulation," A Report presented to the Operations Research Society of America Annual Meeting, 1 June 1967.

CONTEXT INFORMATION PROCESSING

Administrative.

Principal Investigator: Professor M. E. Maron

Sponsoring Agency: National Science Foundation

Period: 7/1/67 to 6/30/68

Amount: $85,000.

Purpose.

The premise of this study is that neither the information conveyed by a document nor the information needs of a library patron can properly be identified solely on the basis of index tags (subjects, e.g.). There are important additional data about each and about the relationship between the two which can be obtained only from an analysis of their context. If context information were identified, formalized, acquired, and stored, it could then be used to enhance both traditional and mechanized search techniques. The approach to this issue has been to study the use of background information about authors (their affiliation, colleagues, etc.), journals (their policies, subject emphasis, etc.), cited papers, and so on in order to determine how such data might be processed in a literature searching system.

Reports.

Final Report in preparation.

MECHANIZED INFORMATION SERVICES

Administrative.

Principal Investigator: Professor R. M. Hayes

Sponsoring Agency: National Science Foundation

Period: 2/11/1966 to 2/10/1967 (extended to 12/31/1967)

Amount: $177,600

Purpose.

The basic premise of this study was that magnetic tape data bases are becoming available and that they are a form of data which university research libraries will begin to acquire. The purposes of the study were to explore the validity of that premise and to define some of its consequences. Such data bases have been developed for a variety of purposes outside those which have normally been considered within the scope of the library. As a result, several problems are faced by the library in extending its scope to include acquiring such media, cataloging them, and providing "information services" based on them. Some of the issues relate to acquisition policy: What kinds of material should the university library acquire? Some of them concern library processes: How should libraries catalog magnetic tape materials? Some them are technological? How does the library process a variety of data bases? And some of them are administrative: How does the library finance such services, fit them within the library's organization, and relate to campus computing facilities?

Reports.

Hayes, R. M., "Mechanized Information Services in the University Library--Introduction and Summary." Part 1 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning, ILR, UCLA, 15 December 1967.

Tompkins, Mary L. "Summary of Symposia on Mechanized Information Services in the University Library." Part 2 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning, ILR, UCLA, 15 December 1967.

Troutman, Joan C. "Inventory of Available Data Bases." Part 3 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 15 December 1967.

Troutman, Joan C. "Standards for Cataloging of Magnetic Tape Material." Part 4 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 15 December 1967.

Reilly, K. D. "Nature of Typical Data Bases." Part 5 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 15 December 1967.

Reilly, K. D. "Evaluation of Generalized File Management Systems." Part 6 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 15 December 1967.

Yeatts, W. A., Jr. and Reilly, K. D. "Experience with Library of Congress MARC Tapes." Part 7 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 1 March 1968.

Tompkins, Mary L. "Experimental On-Line Mathematics Citation Data Base." Part 8 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 15 December 1967.

Hayes, R. M. "Developmental Program for a Center for Information Services." Part 9 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 15 December 1967.

Hayes, R. M. "Preliminary Specifications (Hardware and Software) for a Center for Information Services." Part 10 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 15 December 1967.

Bisco, R. "On the Development of Social Science Information and Documentation Services (Interim Report)." Part 11 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 15 December 1967.

Shoffner, R. M. "Joint Design and Development of Library Systems." Part 12 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 15 December 1967.

Norman, D. A. "The Library and Human Memory." Part 13 of the Final Report on Mechanized Information Services in the University Library. Phase I - Planning. ILR, UCLA, 15 December 1967.

PRINCIPLES OF CATALOGING, PHASE I: DESCRIPTIVE CATALOGING

Administrative.

Principal Investigator: Professor S. Lubetzky

Sponsoring Agency: Office of Education

Period: 6/15/67 to 12/14/68 (extended to 6/30/69)

Amount: $56,300

Purpose.

This project is directed at a historical and theoretical investigation of the fundamental aspects of descriptive and subject cataloging: the purposes to be served, the problems involved, and the principles which should underlie a cohesive, rational, and purposeful cataloging system. The purposes of present cataloging practices have not been uniformly understood and the problems have not been recognized or treated consistently. Even the newly revised Anglo-American Cataloging Rules have been restricted and forced into compromises by prevailing conditions and deep-seated traditions. The study is aimed at formulating principles which are both rational and consistent with the historical development of cataloging practice.

Reports.

No reports as yet.

PUBLIC LIBRARY CENTERS FOR INFORMATION SERVICE

Administrative.

Principal Investigator: Professor R. M. Hayes

Sponsoring Agency: Department of Commerce

Period: 4/1/66 to 12/31/66 (extended to 12/31/67)

Amount: $12,500

Purpose.

The State Technical Services Act of 1965 clearly defines a set of library activities, but with the requirement for technical information centers capable of utilizing mechanized media, such as magnetic tapes and microforms. The purpose of this project was to extend the results obtained under the study of mechanized information services to the context of the public library network of the state.

Reports.

Hayes, R. M. "Preliminary Specification: Mechanized Information Services in Public Library Reference Centers." Part 1 of the Final Report on Specifications of a Mechanized Center for Information Services for a Public Library Reference Center, ILR, UCLA, 31 January 1968.

Reilly, K. D. "A State Library-Network for Technical Information Service to California Business & Industry." Part 2 of the Final Report on Specifications of a Mechanized Center for Information Services for a Public Library Reference Center, ILR, UCLA, 31 January 1968.

Brault, N. W. "Statistics on the Libraries of the State of California." Part 3 of the Final Report on Specifications of a Mechanized Center for Information Services for a Public Library Reference Center, ILR, UCLA, 31 January 1968.

Heron, D. W. "The State Library and Public Libraries of California as Centers for Information Services under the State Technical Services Act." Part 4 of the Final Report on Specifications of a Mechanized Center for Information Services for a Public Library Reference Center, ILR, UCLA, 31 January 1968.

Reilly, K. D. "Outline for a Simulation Study of the California State Library Network." Part 5 of the Final Report on Specifications of a Mechanized Center for Information Services for a Public Library Reference Center, ILR, UCLA, 1 July 1968.

ORGANIZATION AND SEARCH OF BIBLIOGRAPHIC HOLDINGS RECORDS IN ON-LINE COMPUTER SYSTEMS

Administrative.

Principal Investigator: Professor M. E. Maron

Project Director: Mr. R. M. Shoffner

Sponsoring Agency: Office of Education

Period: 7/1/67 to 6/30/68 - Phase I

Amount: $179,700.

Purpose.

The purpose of this project was to study the problems of file organization for an on-line system designed for the interrogation of very large files of bibliographic records. As part of the study, a data base of bibliographical records is being created in machine form. Experiments are being designed to test various methods of file organization for an on-line interrogation system.

Reports.

Maron, M. E. A Study of the Organization and Search of Bibliographic Holdings Records in On-line Computer Systems, ILR, UC Berkeley, 1967. (Proposal, Final Report on Phase I in preparation.)

Maron, M. E. A Study of the Organization and Search of Bibliographic Holdings Records in On-line Computer Systems: Phase II, ILR, UC Berkeley, June 14, 1968. (Proposal.)

Shoffner, Ralph M. "The Organization, Maintenance and Search of Machine Files," Annual Review of Information Science and Technology, V. 3, Encyclopedia Brittanica, Inc., Chicago, 1968.

3. DEVELOPMENT PROJECTS

The development projects of the Institute have been of special importance because of the interests of the Library Council and of the Librarians on each campus in the use of mechanization in the libraries of the University. To an extent, the need for development of mechanized clerical systems was one of the reasons for establishing the Institute in the first place. Since then, the rate of progress in libraries throughout the country has been accelerating. Library networks are being created within several states and among confederations of universities. The development work of the Institute has been at the forefront of this effort.

OPERATIONS TASK FORCE PROJECT

Administrative.

Project Director: Mr. Ralph M. Shoffner

Sponsoring Agency: University of California

Period: 3/1/65-Continuing

Amount: Budgeted from year-to-year

Purpose.

The libraries of the University of California have been faced with many urgent problems for which generally applicable solutions must be found as soon as possible. The Operations Task Force Project was established to provide a State-wide agent for development of methods compatible with the needs of each campus, but applicable universitywide. Examples of the problems with which the Operations Task Force Project has been concerned include: (1) coordination of campus-based programs for mechanization, (2) intercampus circulation studies, (3) methods for producing supplements to the universitywide book catalog.

Reports.

Hayes, R. M. Proposal for a University-Supported Operations Task Force - A Project of the Library Research Institute, 17 November 1964.

Shoffner, R. M. University Union Catalog (I January 1963 to 1 January 1968) Outline of Presentation, Institute of Library Research, University of California, Berkeley, November 12, 1965.

Cartwright, K. C. A Proposed System for Intercampus Circulation, Institute of Library Research, University of California, Berkeley, April 29, 1966.

Shoffner, R. M. Interim Report: Intercampus Circulation - Pilot Project: Phase I Biology Library, University of California, Berkeley, August 15 - October 31, 1966. Institute of Library Research, University of California, Berkeley, November 1966.

Shoffner, R. M. Technical Development Program: A Program Requirement for the Joint Design and Implementation of Library Systems, Institute of Library Research, University of California, Berkeley, February 1, 1967.

Shoffner, R. M. Report of Activities and Plan for Future Operations Institute of Library Research Operations Task Force, Institute of Library Research, University of California, Berkeley, 21 March 1967.

Shoffner, R. M. Operations Task Force Project Status Report and Budget Request Including a Preliminary Projection of Computer-Based Library Systems Development for the University, Institute of Library Research, University of California, Berkeley, June 1, 1967.

Hayes, R. M. Summary Program for the Development of Automated Clerical Systems in the Libraries of the University of California, Institute of Library Research, University of California, Los Angeles, 21 July 1967.

Shoffner, R. M. University Union Catalog - A Comparison of Two Production Methods, Institute of Library Research, University of California, Berkeley, 1967.

HANDBOOK OF DATA PROCESSING

Administrative.

Principal Investigator: Professor R. M. Hayes

Sponsoring Agency: Council on Library Resources

Period: 7/1/65 to 12/13/67 (extended to 12/31/68)

Amount: $68,500

Purpose.

The purpose of this project is the preparation of a Handbook of Data Processing for Libraries, to communicate the economic and operational significance which mechanization has for libraries. It is designed to assist librarians and library system analysts in determining whether and how to apply these techniques to their own library. It relates the characteristics of library requirements to those of available equipment. It is organized into five sections: (1) an introduction that presents the historical context and the general implication of mechanization for libraries, (2) the management of data processing development for libraries, (3) the characteristics of equipment, (4) analyses of the economics of mechanization of various clerical tasks in libraries, and (5) analyses of the role of mechanization in information services of libraries.

Reports.

Hayes, R. M. "Introduction." Chapter 1 of the Review Draft of the Handbook of Data Processing for Libraries, Institute of Library Research, University of California, Los Angeles, 20 February 1968.

Hayes, R. M. "The Present State of Mechanization in Libraries." Chapter 2 of the Review Draft of the Handbook of Data Processing for Libraries, Institute of Library Research, University of California, Los Angeles, 27 February 1968.

Hayes, R. M., and Becker, J. "Scientific Management of Libraries." Chapter 3 of the Review Draft of the Handbook of Data Processing for Libraries, Institute of Library Research, University of California, Los Angeles, 15 April 1968.

Hayes, R. M., and Becker, J. "Cost Accounting in Libraries." Chapter 4 of the Review Draft of the Handbook of Data Processing for Libraries, Institute of Library Research, University of California, 15 March 1968.

Brault, N. B., and Hayes, R. M. "Keeping Up with Library Automation." Working Paper for Appendix 2 of the Review Draft of the Handbook of Data Processing for Libraries, Institute of Library Research, University of California.

Becker, J., and Hayes, R. M. "Management Planning (For Library Data Processing)." Chapter 5 of the Review Draft of the Handbook of Data Processing for Libraries, Institute of Library Research, University of California, 15 April 1968.

Review of: Dougherty and Heinritz. Scientific Management of Library Operation, Scarecrow, 1966. (In Drexel Library Quarterly 31 January 1967:132.)

Review of: Harrison, J., and Laslett, P. (editors) The Brasenose Conference on the Automation of Libraries (Subtitled, "Proceedings of the Anglo-American Conference on the Mechanization of Library Services Held at Oxford Under the Chairmanship of Sir Frank Francis and sponsored by the Old Dominion Foundation of New York, 30 June-July 1966"), Mansell, 1967. (In Special Libraries, 58 (7) September 1967:546-547.)

Hayes, R. M. "Library Systems Analysis." In Data Processing in Public and University Libraries, edited by John Harvey, Washington, D.C., Spartan Books, 1966:5-20.

EVALUATION OF MICROFICHE CAMERA-PROCESSOR

Administrative.

Principal Investigator: Professor R. M. Hayes

Sponsoring Agency: Council on Library Resources

Period: 6/1/66 to 11/30/66 (extended to 12/31/67)

Amount: $3,000

Purpose.

To evaluate the operation and performance of a Microfiche Camera-Processor developed by Houston-Fearless Corporation under contract from the Council on Library Resources.

Reports.

Informal letter reports only.

EVALUATION OF FACSIMILE TRANSMISSION

Administrative.

Principal Investigator: Dean R. C. Swank

Project Director: Mr. Ralph M. Shoffner

Sponsoring Agency: Council on Library Resources

Period: 7/1/66 to 6/30/67 and 1/1/68 to 5/30/68

Amount: $9,000 and $2,000

Purpose.

This experimental study was undertaken to explore the present feasibility of telefacsimile for interlibrary use. The results of the study provide data on the performance, cost, and utility of telefacsimile for libraries.

Reports.

Schieber, W. D., and R. M. Shoffner. Telefacsimile in Libraries, Institute of Library Research, Berkeley, February 1968.

4. EDUCATION PROJECTS

A major part of the program of the Institute of Library Research is the advancement of education in librarianship, information science, and documentation. In part, the extent of the commitment of the Institute to education is represented by the heavy use of students on projects. Over the past two years, forty-six students have served as research assistants. They have come from business administration, from mathematics, from engineering, from English, and from other departments, as well as from the two library schools. More specifically, however, the Institute has been responsible for a number of projects designed to meet an educational requirement.

EDUCATION OF MEDICAL LIBRARY SYSTEMS ANALYSTS

Administrative.

Project Director: Professor R. M. Hayes

Other Faculty: Professor H. Borko

Sponsoring Agency: National Library of Medicine

Period: 2/28/66 to 6/30/69

Amount: $157,000

Purpose.

The increasing demand for greater information services to medicine has led the National Library of Medicine to undertake a numberfof revolutionary steps--mechanization of publication of Index Medicus, mechanized retrieval services through its MEDLARS system, sponsorship of MEDLARS sub-centers throughout the world, sponsorship of regional medical library, and planning for development of a national medical information system. The result is a great and unmet demand for personnel who combine knowledge of librarianship with expertise in systems analysis and application of computers. The purpose of this project is to educate students with this combination of

knowledge. The degree program for Master of Science in Information Science (Documentation) provides the general framework. It is supplemented by internships (as research assistants) in the Institute of Library Research.

Reports.

Hayes, R. M. Education of Medical Library Systems Analysts. Number 1 of a Series of Reports on Education for Information Science (Documentation), Institute of Library Research, University of California, Los Angeles, 1 April 1968.

Hayes, R. M. "Possible Application of Documentation and Information Retrieval for Instructional Purposes." In Conference on the Use of Printed and Audio-Visual Materials for Instructional Purposes, Tauber, M. F., et al. New York, Columbia University, School of Library Service, 1966:210-220.

Hayes, R. M. "Education for Information Systems Analysis," in International Conference on Education for Scientific Information Work, The Hague, Federation Internationale de Documentation (FID), September 1967: 105-114.

Hayes, R. M. Data Processing in the Library School Curriculum. ALA Bulletin 16:662-669, June 1967.

RESEARCH IN INFORMATION SCIENCE

Administrative.

Project Director: Professor Harold Borko

Sponsoring Agency: System Development Corp.

Period: 7/1/66 to 8/31/68

Amount: $2,500

Purpose.

System Development Corporation is an agency with extensive needs for personnel with education in the techniques of information systems analysis. They have therefore provided both direct and indirect support of students in the Master of Science in Information Science (Documentation) program.

Reports.

Cabaniss, Margaret. Using the Computer for Text Collation: Problems Studies, and a Method for Solution, Master's Thesis, UCLA, 1968.

Pearson, Karl. Providing for Machine-Readable Statistical Data Sets in University Research Libraries, Master's Thesis, UCLA, 1968.

AN INFORMATION PROCESSING LABORATORY FOR EDUCATION AND RESEARCH IN LIBRARY SCIENCE

Administrative.

Principal Investigator: Professor M. E. Maron

Period: 7/1/67 to 12/31/68

Amount: $141,700

Purpose.

The motivation for this project is the need for intimate familiarity, on the part of library school students, with the capabilities of computers and the problems in applying them to information processing. The purpose of this project is to develop, operate, and evaluate the utility of a computer-based laboratory as a means of teaching principles of librarianship to library school students. First, it will provide tools for demonstrating and use of formal techniques for obtaining access to stored literature. Second, it will provide means for use of computer-assisted instruction in both formal and traditional librarianship. Third, it will provide the means for advanced students to conduct their own research.

Reports.

None.

EXTENSION COURSES IN SUPPORT OF INFORMATION TRANSFER IN SCIENCE AND TECHNOLOGY

Administrative.

Principal Investigator: Professor R. M. Hayes

Extension Coordinator: Dr. John Fitz

Sponsoring Agency: Department of Commerce

Period: Phase 1: 4/1/66 to 6/30/67

Phase 2: 7/1/66 to 12/31/67

Phase 3: 1/1/67 to 6/30/69

Amount: Phase 1: $19,000 (plus equal matching funds from University Extension, fees, and other sources)

Phase 2: $44,000 (plus equal matching funds from University Extension, fees, and other sources)

Phase 3: $68,000 (plus equal matching funds from University Extension, fees, and other sources)

Purpose.

The State Technical Service Program of the Department of Commerce was established to aid the transfer of scientific and technical information to small business and industry. Among its objectives are the sponsoring of extension courses designed to acquaint businessmen with the sources of such information. The purpose of this project of the Institute has been to develop such courses (Phase 1), experiment to determine the best means of presenting them to the desired audience (Phase 2), and then support the presentation of them throughout the state (Phase 3).

Reports.

Hayes, R. M. A Proposal to the Secretary of Commerce for Support of a Program under the "State Technical Services Act of 1965," ILR, UCLA, 1966.

Hayes, R. M. Supplement to the Education Program of the University of California Extension Under the State Technical Services Act, ILR, UCLA, 1966.

Hayes, R. M. Supplement to the Educational Program of the Educational Program of the Extension Division Under the State Technical Services Act, ILR, UCLA, 1967.

Fitz, J. Progress Report, June 30, 1967.

Fitz, J. Progress Report, December 31, 1967.

Fitz, J. Progress Report, June 30, 1968.

Fitz, J. Final Narrative Summary Report, STSA Project No. 6, Phase 1, December 31, 1967.

Fitz, J. Status Report, STSA Project No. 6 - Phases 1, 2, 3, June 25, 1968.

Brochures and Announcements.

State Technical Services Act Programs, Summer, 1967 Brochure

State Technical Services Act Programs at UCLA, Fall, 1967 Brochure

Literature on Lasers and Their Applications, April 20, 1968 (Lockheed Management Association, Sunnyvale, Sponsored Conference Announcement)

2 Industrial Technology Utilization Workshops; 827-A Metallic Materials, 827-B Non-Metallic Materials. April-May, 1968 Brochure

Two-page advertisement - Lifelong Learning, Fall, 1967

One-page advertisement - Lifelong Learning, Winter, 1968

Southern California Chapter Special Libraries Association, State Technical Services Act Programs at UCLA, Summer, 1967 Bulletin p. 135-6.

I. Attendance and Courses Given Under Phase II of STS Project - 1967/68

Attendance		
	Summer	
16	1.	Technical Information Center, Management and Operation (13 week course)
28	2.	Document Retrieval System - Analysis and Design (13 week course)
108	3.	Literature on Lasers and Their Applications (1 Day Conference)
152		
	Fall	
12	1.	Instrumentation Information Sources (1 Day Conference) UCLA
22	2.	Engineering Materials and Properties Information Centers and Services (1 Day Conference) UCLA
20	3.	Literature on Lasers and Their Applications (1 Day Conference) UCLA
8	4.	Technical Information Center. Management and Operation (12 Session Course) UCLA
12	5.	Document Retrieval System - Analysis and Design (12 Session Course) UCLA
74		
	Winter/Spring	
92	1.	Literature on Lasers and Their Applications (1 Day Conference) Sunnyvale
7	2.	Non-Metallic Materials Industrial Utilization Workshop (5 Day Course) Long Beach
18	3.	Metallic Materials Industrial Technology Utilization Workshop (5 Day Course) Long Beach
117		
343		

LINGUISTIC INSTITUTE

Administration.

Project Director: Professor Jaan Puhvel

Period: 6/17/66 to 8/12/66

Purpose.

This was an effort of the Center for Research in Languages and Linguistics and the Department of Linguistics of the Los Angeles Campus. The Institute of Library Research was asked to act as a co-sponsor, responsible for those aspects related to linguistic data processing and information retrieval. Those courses included:

Introduction to Mathematical Linguistics, Edmundson

Introduction to Algebraic Linguistics, Hall

Introduction to Computational Linguistics, Hays

Linguistics in Language Data Processing and Information Retrieval, Simmons

Linguistic Theories of Information Structure, Thompson & Gardin

Automatic Document Indexing & Classification, Borko

Reports.

None.

5. PUBLIC SERVICE

The Institute of Library Research has, from its beginning, provided a large degree of "public service"--through projects designed to serve libraries of the State of California, through discussions with people from throughout the world, and through extensive participation of its staff in professional activities. The list of talks given by Institute staff members during the past two years alone contains over one hundred entries. The list of foreign visitors to the Institute during the past two years contains over thirty entries.

IMPLICATIONS OF A BOOK FORM CATALOG FOR THE STATE OF CALIFORNIA

Administrative.

Principal Investigator: Professor R. M. Hayes

Sponsoring Agency: State Library of the State of California

Period: September 1965 to 31 December 1966.

Amount:

Purpose.

The major purpose of this study was to provide the analysis and quantitative data on which to base decisions about policy issues relating to the publication of the catalogs of the State Library and of the California Union Catalog in book form. The technical issues in the study included: (1) should the catalogs be produced in book form? (2) what method should be used to do so? and (3) how should they be organized?

Reports.

Shoffner, R. M. Preliminary Evaluation of the Feasibility of Mechanization, Report to the California State Library, Institute of Library Research, University of California, Berkeley, 1 January 1966.

Cartwright, K. L., and Shoffner, R. M. Catalogs in Book Form: A Research Study of their Implications for the California State Library and the California Union Catalog, with a Design for their Implementation, Institute of Library Research, University of California, Berkeley, January, 1967.

SYSTEMS DESIGN OF A PROCESSING CENTER

Administrative.

Principle Investigator: Dean R. C. Swank

Project Director: Mr. R. M. Shoffner

Sponsoring Agency: State Library of the State of California

Period: 6/21/67 to 5/31/69

Amount: $97,000

Purpose.

The purpose of this study is to develop design specifications for a processing center providing capabilities for both serials control and book catalog production, as a service to the State Library and other public libraries of the state.

Reports.

None.

LIBRARY UTILIZATION

Administrative.

Principal Investigator: Professor R. M. Hayes

Co-Principal Investigator: Mr. J. Cushman

Sponsoring Agency: Los Angeles Public Library

Period: 6/28/68 to 11/29/68

Amount: $11,600

Purpose.

The purpose of the study is to develop a quantitative picture of the users of the main library--what they want from it, where they come from, and when they use it. A questionnaire was prepared and users of the library were interviewed (both, with the cooperation of the Survey Research Center at UCLA). The data is being analyzed.

Reports.

Hayes, R. M., and Cushman, J. A Proposal for a Survey of Main Library Utilization, Institute of Library Research, University of California, 1968.

Cushman, J. Survey Procedures: Report 1 of a Series on a Survey of the Users of the Los Angeles Central Library, Institute of Library Research, University of California, Los Angeles, 1968.